

HW:

p. 76: 17-22

Quiz tomorrow

- Histograms
- Stem and leaf plots
- Shape
- Modality

5 Number Summary:

- Maximum Value
- Minimum Value
- Median
- $Q_1$
- $Q_3$

• Interquartile Range (IQR):

$$IQR = Q_3 - Q_1$$

• Mean:

- Sum all values and divide by the number of values

$$\bar{y} = \frac{\text{total}}{n} = \frac{\sum y}{n}$$

$\bar{y}$ -bar      ↑      number of terms      ↑      uppercase Sigma means "sum of"

• Example:

Data Set:  $y = 1, 2, 3, 4, 5$  Median = 3

$$\begin{aligned} \bar{y} &= \frac{\sum y}{n} = \frac{1+2+3+4+5}{5} \\ &= \frac{15}{5} \\ &= 3 \end{aligned}$$

- In this example, mean and median are the same value. This is not often the case, especially when dealing with "real" data sets.

- Example from worksheet p. 4-13:

$$\bar{y} = \frac{\sum (\text{number of plants})(\text{number of states})}{\text{number of states}}$$

$$= \frac{(0)(19) + (1)(12) + (2)(11) + (3)(4) + (4)(2) + (5)(1) + (6)(1)}{50}$$

$$= \frac{0 + 12 + 22 + 12 + 8 + 5 + 6}{50}$$

$$= 1.3 \text{ plants/state}$$

- Variance:

- Sometimes it is useful to know how far data values are from the mean

- Equation:

$$s^2 = \frac{\sum (y - \bar{y})^2}{n - 1}$$

$\sigma$  → sum of  
 $y$  = variable value  
 $\bar{y}$  = mean  
 $n$  = number of terms  
 Variance (yes, it is a squared value)

• Ex: 1, 2, 3, 4, 5

$$\bar{y} = 3 \quad n = 5$$

$$\begin{aligned}
 s^2 &= \frac{\sum (y - \bar{y})^2}{n - 1} \\
 &= \frac{(1-3)^2 + (2-3)^2 + (3-3)^2 + (4-3)^2 + (5-3)^2}{5 - 1} \\
 &= \frac{4 + 1 + 0 + 1 + 4}{4} \\
 &= \frac{10}{4} \\
 &= 2.5
 \end{aligned}$$

- Standard Deviation:
  - Another measure of how far values are from the mean
  - Equation:

$$S = \sqrt{\text{variance}}$$

$$\text{Standard deviation} = \sqrt{S^2}$$

$$= \sqrt{\frac{\sum (y - \bar{y})^2}{n-1}}$$

- Example from previous page:

$$S^2 = 2.5$$

$$S = \sqrt{S^2} = \sqrt{2.5} = 1.58$$